From Norm 3/92

IMPLICATIONS OF TRANSFER OF NAVY WATER RIGHTS TO PYRAMID LAKE

Section 206(c) of Public Law 101-618, requires the Secretary of the Navy to undertake a study of water rights owned by the Naval Air Station, Fallon, to determine if water deliveries to that area can be safely reduced. Any water saving resulting from implementation of suggested efficiency management options, are to be used by the Secretary of the Interior for the benefit of fish and wildlife resources at both Pyramid Lake and the Lahontan Valley wetlands as referenced in the bill under sections 206 and 207.

Currently the Navy is in possession of 2,934 acres of water righted land, with a headgate entitlement of 10,269 acre feet of water. All lands within the Naval Air Station are classified as bottom lands with a water duty of 3.5 acre feet per acre. These water rights are being leased to local farmers to grow alfalfa and pasture which provide dust control, fire abatement and safety, and foreign object damage control.

In conversations with Navy personnel, they have indicated that they may be able to save up to 30% of their water demands through changes in farming practices on the base. Conversations with Chester Buchanan of the Fish and Wildlife Service representatives indicate that he is planning on transferring 100% of the Navy water to Pyramid Lake for Cui-ui recovery. These represent the two extremes in the thinking of what could be transferred off of the Navy lands. If all water is transferred to Pyramid Lake and none allowed to be transferred to the wetlands, then significant impacts to the wetlands will occur unless addition water is purchased.(See Table Below)

% Reduction in Navy Water Rights	Acre Feet of Water Right	Reduced Total Diversions From Lahontan Reservoir	Reduced Inflow to LV Wetlands	Reduced Inflow to Primary Wetlands	Estimated Net Gain to Pyramid Lake	Impact on Newlands Project Efficiency
100%	10,269 ac/ft	15,993 ac/ft	6,029 ac/ft	4,022 ac/ft	15,993 ac/ft	-1.4%
50%	5,135 ac/ft	7,996 ac/ft	3,015 ac/ft	2,011 ac/ft	7,996 ac/ft	-0.7%
30%	3,080 ac/ft	4,797 ac/ft	1,808 ac/ft	1,206 ac/ft	4,797 ac/ft	-0.4%

(Calculations based upon attached model sheets)

The 1912-91 average annual flow on the Carson River just above Lahontan Reservoir has been 285,324 acre feet. Water released from Lahontan in 1989, which was the last 100% allocation year, was 321,729 acre feet. If the 321,729 were representative of future average annual releases in normal water years, then the flow of the Carson River would be equal to 88.7% of the water used on the Carson Division of the Newlands Project, not including evaporation losses on Lahontan Reservoir. This means is that the water used on the Fallon Naval Air Station is made up of a high percentage of Carson River water and to transfer the total amount to Pyramid Lake could be thought of as an interbasin water transfer from the Carson to the Truckee system.

Transferring of 100% of the Navy's water right will cause a decrease in Newlands Project efficiency by approximately 1.4%, because basic system losses will remain virtually unchanged and there will be 2,934 acres less land in production. While 1.4% doesn't sound like much, and in actuality can't be

measured with current techniques, it amounts to between approximately 4,360 and 3,950 acre feet of water which the project will be required to save or make up just to maintain their efficiency rate. A high percentage of those savings will probably have to come from pump back of drain water which would have entered the wetlands.

Additionally, transfers of the total Navy water to Pyramid Lake would not only impact flight operations at the Naval Air Station but would have other adverse impact on the wetlands. Return flows to the wetlands which have historically accrued from the water used on the Navy land would be lost and will have to be made up by acquisition of additional water rights. Rather than purchase additional water rights from private agriculture, an amount of water equal to what had accrued to the wetlands from return flows could be transferred to both Stillwater and Carson Lake.

Just these two factors could reduce wetland inflows by up to 10,390 acre feet of water annually if 100% of the Navy water rights are transferred to Pyramid Lake. Under the 30% transfer scenario, wetland losses would still amount up to approximately 3,070 acre feet annually. In the past, both the Federal Government and the State of Nevada have been required to make transfers of water rights to the wetlands in such a way that there were no negative impacts to Pyramid Lake inflows. Currently wetland water transfers are being made under constraints which are actually providing water to Pyramid because of the reduced transfer rate. This same consideration should also apply to water right transfers to Pyramid Lake and any transfer should be adjusted to neutralize wetland impacts. The maximum amount of water estimated which would need to be acquired for the wetlands to offset the losses created by the Navy water transfer to the Truckee could amount to as much 12,162 acre feet because of the reduced wetland transfer rate. The cost under the worst case scenario to acquire the replacement water would be $416,967.00 at $1,200.00 per water righted acre.

It seems hard to justify this transfer to the Truckee River system in light of the impacts to the Lahontan Valley wetlands, the cost of mitigating those impacts, and the fact that a high percentage of the water used on the Navy lands is actually Carson River water. A better option may be to transfer all water savings to the wetlands and use the money saved toward the purchase water rights from either the Truckee Division of the Newlands Project or from Truckee River water right holders.

CARSON RIVER DATA

1912-91 Average annual flow on calendar year @ Fort Churchill - 285,324 ac/ft
1989 releases from Lahontan Reservoir (Yardis model) - 321,729 ac/ft
Simulated 80 year OCAP - JROD - (Yardis model) - 284,850 ac/ft

Ratio of Carson River inflow to Lahontan Releases -
1989 - 285,324/321,729 = 88.7%
JROD OCAP simulation - 285,324/284,850 = 100.2%

NAVY WATER RIGHTS

2,934 water righted acres @ 3.5 ac/ft/ac = 10,269 ac/ft
50% Reduction = 5,135 ac/ft
30% Reduction = 3,080 ac/ft

EFFICIENCY REDUCTIONS

Head gate entitlement on Carson Division - 197,110 ac/ft

1989 efficiency rate = 61.3% (197,110/321,596 =61.3)

100% Transfer-
321,729-10,269 = 311,460 ac/ft 197,110-10,269 = 186,841 ac/ft
186,841/311,460 = 59.9%
61.3-59.9 = 1.4% reduction in efficiency
1.4 X 311,460 = 4,360 ac/ft savings needed to maintain eff.

30% Transfer-
321,729-3,080 = 318,649 ac/ft 197,110-3,080 = 194,030 ac/ft
194,030/318,649 = 60.9%
61.3-60.9 = .4% reduction in efficiency
0.4 X 318,640 = 1,275 ac/ft saving needed to maintain eff.

\HONTAN VALLEY WETLANDS INFLOWS AT ALTERNATE TRANSFER RATES

RIABLES

1467.00 ACRES of WATER RIGHT TRANSFERRED
NAVY WATER RIGHTS - 50% TRANSFERRED

1.	95.0%	Percent of water right allocation est. delivered to head gate
2.	61.0%	Percent project efficiency
3.	37.7%	Percent of total diversions received by wetlands as return flows
4.	66.7%	Percent of est. return flows to primary wetlands
5.	97.5%	Percent of water right est. to be delivered to wetlands

PRE-TRANSFER DATA

	BENCH			BOTTOM		
der Right Allocation per Acre	4.50	4.50	4.50	3.50	3.50	3.50
Allocation per Acres Transferred	6601.5	6601.5	6601.5	5134.5	5134.5	5134.5
Percent of allocation Delivered (1)	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Est. Acre feet Delivered	6,271	6,271	6,271	4,878	4,878	4,878
Est. Project Efficiency (2)	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
Est. Total Project Diversions for Water right	10,281	10,281	10,281	7,996	7,996	7,996
Est. Percent Received by LVW Wetlands (3)	37.7%	37.7%	37.7%	37.7%	37.7%	37.7%
Est. Total LVW Inflow	3,876	3,876	3,876	3,015	3,015	3,015
Est. Percent of Inflow to Primary Wetlands (4)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
Est. Acre Feet Received by Primary Wetlands	2,585	2,585	2,585	2,011	2,011	2,011
Percent of Wetlands Inflow from Headgate (5)	33.3%	33.3%	33.3%	24.5%	24.5%	24.5%
Est. of Inflows Derived from Irrigation	2,088	2,088	2,088	1,195	1,195	1,195
Est. of Inflows Derived from Conveyance	1,788	1,788	1,788	1,820	1,820	1,820
Ratio of Total Diversion / Conveyance Inflows	17.4%	17.4%	17.4%	22.8%	22.8%	22.8%

POST-TRANSFER ESTIMATES

Wetlands Transfer Rate	4.50	3.50	2.99	3.50	2.99	0.00
Allocation in acre/feet	6601.5	5,135	4,386	5,135	4,386	0
Percent of Allocation Delivered (6)	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%
Acre Feet Delivered	6,436	5,006	4,277	5,006	4,277	0
Est. Project Efficiency	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
Est. Total Associated Diversion	10,552	8,207	7,011	8,207	7,011	0
Ratio of Total Div/Conv Inflow (#13)	17.4%	17.4%	17.4%	22.8%	22.8%	22.8%
Est. Return Flows from conveyance losses	1,835	1,427	1,219	1,867	1,595	0
Est. Total Inflows to LV Wetlands	8,271	6,433	5,496	6,874	5,872	0
Est Inflows to Primary Wetlands	7,660	5,958	5,090	6,252	5,341	0
Est. Net Gain to LV Wetlands	4,395	2,557	1,620	3,859	2,857	-3,015
Est Net Gain to Primary Wetlands	5,075	3,373	2,504	4,241	3,330	-2,011
Net Gain or Loss to Truckee Riv. (AC/FT)	-271	2,074	3,270	-210	985	7,996

imary wetlands = Stillwater WMA, Carson Lake, and Fernley WMA.

AHONTAN VALLEY WETLANDS INFLOWS AT ALTERNATE TRANSFER RATES

RIABLES

2934.00 ACRES of WATER RIGHT TRANSFERRED
NAVY WATER RIGHTS - 100% TRANSFERRED

1.	95.0%	Percent of water right allocation est. delivered to head gate
2.	61.0%	Percent project efficiency
3.	37.7%	Percent of total diversions received by wetlands as return flows
4.	66.7%	Percent of est. return flows to primary wetlands
5.	97.5%	Percent of water right est. to be delivered to wetlands

PRE-TRANSFER DATA

	BENCH			BOTTOM		
ater Right Allocation per Acre	4.50	4.50	4.50	3.50	3.50	3.50
Allocation per Acres Transferred	13203	13203	13203	10269	10269	10269
Percent of allocation Delivered (1)	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
Est. Acre feet Delivered	12,543	12,543	12,543	9,756	9,756	9,756
Est. Project Efficiency (2)	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
Est. Total Project Diversions for Water right	20,562	20,562	20,562	15,993	15,993	15,993
Est. Percent Received by LVW Wetlands (3)	37.7%	37.7%	37.7%	37.7%	37.7%	37.7%
Est. Total LVW Inflow	7,752	7,752	7,752	6,029	6,029	6,029
Est. Percent of Inflow to Primary Wetlands (4)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
Est. Acre Feet Received by Primary Wetlands	5,171	5,171	5,171	4,022	4,022	4,022
). Percent of Wetlands Inflow from Headgate (5)	33.3%	33.3%	33.3%	24.5%	24.5%	24.5%
. Est. of Inflows Derived from Irrigation	4,177	4,177	4,177	2,390	2,390	2,390
. Est. of Inflows Derived from Conveyance	3,575	3,575	3,575	3,639	3,639	3,639
. Ratio of Total Diversion / Conveyance Inflows	17.4%	17.4%	17.4%	22.8%	22.8%	22.8%

POST-TRANSFER ESTIMATES

. Wetlands Transfer Rate	4.50	3.50	2.99	3.50	2.99	0.00
. Allocation in acre/feet	13203	10,269	8,773	10,269	8,773	0
. Percent of Allocation Delivered (6)	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%
. Acre Feet Delivered	12,873	10,012	8,553	10,012	8,553	0
3. Est. Project Efficiency	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
. Est. Total Associated Diversion	21,103	16,414	14,022	16,414	14,022	0
. Ratio of Total Div/Conr Inflow (#13)	17.4%	17.4%	17.4%	22.8%	22.8%	22.8%
. Est. Return Flows from conveyance losses	3,669	2,854	2,438	3,735	3,191	0
. Est. Total Inflows to LV Wetlands	16,542	12,866	10,991	13,747	11,744	0
3. Est Inflows to Primary Wetlands	15,320	11,916	10,179	12,503	10,682	0
. Est. Net Gain to LV Wetlands	8,790	5,114	3,239	7,718	5,715	-6,029
. Est Net Gain to Primary Wetlands	10,150	6,745	5,009	8,482	6,660	-4,022
Net Gain or Loss to Truckee Riv. (AC/FT)	-541	4,148	6,540	-421	1,971	15,993

rimary wetlands = Stillwater WMA, Carson Lake, and Fernley WMA.

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AHONTAN VALLEY WETLANDS INFLOWS AT ALTERNATE TRANSFER RATES

VARIABLES

880.00 ACRES of WATER RIGHT TRANSFERRED
NAVY WATER RIGHTS - 30% TRANSFERRED

1.	95.0%	Percent of water right allocation est. delivered to head gate
2.	61.0%	Percent project efficiency
3.	37.7%	Percent of total diversions received by wetlands as return flows
4.	66.7%	Percent of est. return flows to primary wetlands
5.	97.5%	Percent of water right est. to be delivered to wetlands

PRE-TRANSFER DATA

	BENCH			BOTTOM		
Water Right Allocation per Acre	4.50	4.50	4.50	3.50	3.50	3.50
1. Allocation per Acres Transferred	3960	3960	3960	3080	3080	3080
2. Percent of allocation Delivered (1)	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%
3. Est. Acre feet Delivered	3,762	3,762	3,762	2,926	2,926	2,926
4. Est. Project Efficiency (2)	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
5. Est. Total Project Diversions for Water right	6,167	6,167	6,167	4,797	4,797	4,797
6. Est. Percent Received by LVW Wetlands (3)	37.7%	37.7%	37.7%	37.7%	37.7%	37.7%
7. Est. Total LVW Inflow	2,325	2,325	2,325	1,808	1,808	1,808
8. Est. Percent of Inflow to Primary Wetlands (4)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
9. Est. Acre Feet Received by Primary Wetlands	1,551	1,551	1,551	1,206	1,206	1,206
10. Percent of Wetlands Inflow from Headgate (5)	33.3%	33.3%	33.3%	24.5%	24.5%	24.5%
11. Est. of Inflows Derived from Irrigation	1,253	1,253	1,253	717	717	717
12. Est. of Inflows Derived from Conveyance	1,072	1,072	1,072	1,091	1,091	1,091
13. Ratio of Total Diversion / Conveyance Inflows	17.4%	17.4%	17.4%	22.8%	22.8%	22.8%

POST-TRANSFER ESTIMATES

14. Wetlands Transfer Rate	4.50	3.50	2.99	3.50	2.99	0.00
15. Allocation in acre/feet	3960	3,080	2,631	3,080	2,631	0
16. Percent of Allocation Delivered (6)	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%
17. Acre Feet Delivered	3,861	3,003	2,565	3,003	2,565	0
18. Est. Project Efficiency	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%
19. Est. Total Associated Diversion	6,330	4,923	4,206	4,923	4,206	0
20. Ratio of Total Div/Conr Inflow (#13)	17.4%	17.4%	17.4%	22.8%	22.8%	22.8%
21. Est. Return Flows from conveyance losses	1,101	856	731	1,120	957	0
22. Est. Total Inflows to LV Wetlands	4,962	3,859	3,297	4,123	3,522	0
23. Est Inflows to Primary Wetlands	4,595	3,574	3,053	3,750	3,204	0
24. Est. Net Gain to LV Wetlands	2,636	1,534	972	2,315	1,714	-1,803
Net Gain to Primary Wetlands	3,044	2,023	1,502	2,544	1,998	-1,206
Net Gain or Loss to Truckee Riv. (AC/FT)	-162	1,244	1,962	-126	591	4,797

Primary wetlands = Stillwater WMA, Carson Lake, and Fernley WMA.